REMARKS

Claims 1-42 as amended, remain herein.

Attached hereto is a marked-up version of the changes made to the claims by the current amendment. The attached pages are captioned "Version with Markings to Show Changes Made".

The specification, page 2, first and second paragraphs, has been amended to describe the prior art laser device as corresponding to proposed Figure 13, wherein the prior art laser device is described by a reference numeral different from the reference numeral associated with the presently claimed invention.

The specification, page 7, Brief Description of the Drawings, line 6, the description of Figure 5 has been amended to replace the word "embodiment" with "embodiments"; page 7, line 12, the description of Figure 8 has been amended to clarify that the described laser device is according to the first embodiment; page 7, after line 20, has been amended to include a brief description of proposed prior art Figure 13; and page 7, line 24, has been amended to describe Fig. 8 as showing the first embodiment operated according to Fig. 1.

Page 8, second full paragraph, has been amended to more clearly describe the phrase "extracted by", recited in applicants' claims. The phrase "extracted by" is defined in the specification at page 8, second full paragraph, describing the second pulse period T2A as equal to the duration of a pulse period T0 of the laser pulse train extracted by a pulse width TW. The specification has been amended herein to further describe the aforementioned definition of "extracted by" in terms of the corresponding pulses illustrated in Fig. 1, stating that the second pause period T2A is equal to the duration of a pulse period T0 of the laser pulse train extracted by a pulse width TW, i.e., T2A=T0-TW. In other words, the second pause period T2A is equal to a duration determined through extracting a pulse width TW from a pulse period T0 of the laser pulse train. Accordingly, the phrase "extracted by" recited in applicants' claims is fully defined in the specification, and therefore applicants' claims are definite.

Claims 1-3, 5-7, 9-24, 26-32 and 34-36 have been amended more clearly to describe applicants' invention. Claims 1 and 18 have been amended to describe the Q switch in terms of the recitation

originally following the "wherein" clause. New claims 37-42 directed to other aspects of the invention have been added. In claims 6, 7, 13, 14, 23, 24, 31 and 32 have been amended to replace the phrase "a period of the laser pulse train extracted by a width of the laser pulse" with "a duration comprising a width of each of laser pulses extracted from a period of the laser pulse train."

Claims 10, 28 have been amended to recite "wherein the laser light continuously oscillates during the first pause period." See specification, page 8, second full paragraph.

1. The drawings were objected to because Figures. 7-12 should be labeled "Prior Art." Submitted herewith is a Request for Approval of New Drawing and Drawing Changes accompanied by copies of Figures 7-12, showing the requested changes in red.

New Figure 13, labeled "Prior Art" has been proposed, showing features of the prior art Q switch described in the specification, as originally filed.

Approval of the new drawing and proposed drawing changes and withdrawal of the objection to the drawings are respectfully requested.

2. Claims 3-7, 13, 14 and 20-24 were rejected under 35 U.S.C. §112, second paragraph. Claims 3 and 20 have been amended to recite a harmonic dispensing device for dispensing harmonic laser pulses. See specification, page 9, line 26 to page 10, line 2.

In claims 5 and 22, location of the nonlinear optical crystal is clarified. Claims 5 and 22 have been amended to recite the output mirror being located between the reflector mirror and the nonlinear optical crystal.

Claims 6, 13 and 23 have been amended to delete "substantially".

Claims 6, 7, 13, 14, 23, 24, 31 and 32 have been amended to replace the phase "a period of the laser pulse train extracted by the width of the laser pulses" with "a duration comprising a width of each of laser pulses extracted from a period of the laser pulse train." The phrase "extracted by" was used in the original specification at page 8. The specification at page 8, is hereby amended for even greater clarity.

Reconsideration and withdrawal of this rejection are respectfully requested.

3. Claims 1, 5-9, 18 and 22-26 were rejected under 35 U.S.C. §102(b) over Applicants' Admitted Prior Art as described in the specification.

The presently claimed laser device includes a Q switch configured for turning on laser oscillation during a first pause period before a generation of the laser pulse train, and for turning off the laser oscillation during a second pause period before a generation of the laser pulse. This arrangement and corresponding method are nowhere disclosed or suggested in Applicants' Admitted Prior Art as described in the specification.

The Office Action alleges that the presently claimed laser device is described in Applicants Admitted Prior Art, citing applicants' Figure 8. The description of a prior art embodiment in the specification, page 2, first and second paragraphs, has been amended to describe the prior art laser device as corresponding to proposed Figure 13, wherein the prior art laser device is described by a reference numeral different from the reference numeral associated with the presently claimed invention. In contrast, the presently claimed invention, shown in Figure 8 and described in the specification, page 8, beginning at line 6, has a Q switch

structure that turns on and off according to a calculated second pause period T2A being a duration calculated by subtracting a pulse width TW from pulse period T0. Stated differently, the presently claimed Q switch is for turning on laser oscillation during a first pause period before a generation of the laser pulse train, and for turning off the laser oscillation during a second pause period before a generation of the laser pulse, as recited in applicants' claims 1 and 18. Nowhere in applicants' disclosure, is there any statement that a prior art laser device has structure for operating in such a way.

For the foregoing reasons, Applicants' Admitted Prior Art, as described in the specification, fails to disclose all elements of applicant's claimed invention, and therefore is not a proper basis for rejection under §102. And, there is no disclosure or teaching in Applicants' Admitted Prior Art that would have suggested the desirability of modifying any portions thereof effectively to anticipate or suggest applicant's presently claimed invention. Claims 5-9, which depend from claim 1 are allowable for the same reasons as claim 1, and claims 22-26, which depend from claim 18, are allowable for the same reasons as claim 18. Accordingly,

reconsideration and withdrawal of this rejection are respectfully requested.

4. Claims 10, 11, 13-15, 28, 29 and 31-33, were rejected under 35 U.S.C. §102(b) over Johnson et al. U.S. Patent 4,930,901.

The presently claimed laser method comprises turning on the laser oscillation during a first pause period before a generation of the laser pulse train, wherein the laser device is oscillated continuously during the first pause period, as described in applicants' claims 10, 18, 28, 37 and 40.

In contrast, the laser disclosed in Johnson '901, Figs. 3(d) and 3(e), does not operate continuously during each period when the Q switch turns on, as shown by the illustrated pulse train.

For the foregoing reasons, Johnson '901 fails to disclose all elements of applicant's claimed invention, and therefore is not a proper basis for rejection under §102. And, there is no disclosure or teaching in Johnson '901 that would have suggested the desirability of modifying any portions thereof effectively to anticipate or suggest applicant's presently claimed invention. Claims 11 and 13-15, which depend from claim 10 are allowable for the same reasons as claim 10, and claims 29 and 31-33, which depend

from claim 28, are allowable for the same reasons as claim 28. Accordingly, reconsideration and withdrawal of this rejection are respectfully requested.

5. Claims 2 and 19 were rejected under 35 U.S.C. §103(a) over Yin U.S. Patent 6,108,356. The Office Action cites Yin '356 as disclosing locating a nonlinear optical crystal between mirror M1 and reflecting mirror M2. However, Yin '356 does not teach or suggest a laser device including a Q switch configured for turning on laser oscillation during a first pause period before a generation of the laser pulse train, and for turning off the laser oscillation during a second pause period before a generation of the laser pulse train, as recited in applicants' claims 1 and 18.

For the foregoing reasons, Yin '356 does not contain any teaching, suggestion, reason, motivation or incentive that would have led one of ordinary skill in the art to applicants' claimed invention. Claims 2 and 19, which depend from claims 1 and 18, respectively, are allowable for the same reasons as claims 1 and 18. Accordingly, reconsideration and withdrawal of this rejection are respectfully requested.

6. Claims 3, 4, 20 and 21 were rejected under 35 U.S.C. §103(a) over applicants admitted prior art, as described in applicants' specification, and Smart U.S. Patent 6,339,604. The Office Action cites Smart '604 as teaching a harmonic dispensing device. However, Smart '604 does not teach or suggest a laser device including a Q switch configured for turning on laser oscillation during a first pause period before a generation of the laser pulse train, and for turning off the laser oscillation during a second pause period before a generation of the laser pulse train, as recited in applicants' claims 1 and 18.

For the foregoing reasons, neither applicant's admitted prior art nor Smart '604 contains any teaching, suggestion, reason, motivation or incentive that would have led one of ordinary skill in the art to applicants' claimed invention. Nor is there any disclosure or teaching in either of these references which would have suggested the desirability of combining any portions thereof effectively to anticipate or suggest applicants' presently claimed invention. Claims 3 and 4, which depend from claim 1, and claims 20 and 21, which depend from claim 18, are allowable for the same reasons as claims 1 and 18, respectively. Accordingly,

reconsideration and withdrawal of this rejection are respectfully requested.

7. Claim 27 was rejected under 35 U.S.C. §103(a) over applicants' admitted prior art, as described in applicants' specification, and Johnson '901. The Office Action cites Johnson '901 as teaching a laser processing machine. However, Johnson '901 does not teach or suggest a laser device including a Q switch configured for turning on laser oscillation during a first pause period before a generation of the laser pulse train, and for turning off the laser oscillation during a second pause period before a generation of the laser pulse train, as recited in applicants' claim 18, from which claim 27 depends.

For the foregoing reasons, neither applicant's admitted prior art, as described in the specification, nor Johnson '901 contains any teaching, suggestion, reason, motivation or incentive that would have led one of ordinary skill in the art to applicants' claimed invention. Nor is there any disclosure or teaching in either of these references which would have suggested the desirability of combining any portions thereof effectively to anticipate or suggest applicants' presently claimed invention.

Accordingly, reconsideration and withdrawal of this rejection are respectfully requested.

8. Claims 12 and 30 were rejected under 35 U.S.C. §103(a) over applicants Johnson '901 and Smart '604. The Office Action cites Smart '604 as teaching a harmonic dispensing device for dispensing a laser pulse. However, Smart '604 does not teach or suggest a laser device including a Q switch configured for turning on laser oscillation during a first pause period before a generation of the laser pulse train, and for turning off the laser oscillation during a second pause period before a generation of the laser pulse train, as recited in applicants' claims 18 and 28.

For the foregoing reasons, neither Johnson '901 nor Smart '604 contains any teaching, suggestion, reason, motivation or incentive that would have led one of ordinary skill in the art to applicants' claimed invention. Nor is there any disclosure or teaching in either of these references which would have suggested the desirability of combining any portions thereof effectively to anticipate or suggest applicants' presently claimed invention. Claims 12 and 30, which depend from claims 18 and 28, respectively, are allowable for the same reasons as claims 18 and 28.

Accordingly, reconsideration and withdrawal of this rejection are respectfully requested.

9. Claims 16, 34 and 35 were rejected under 35 U.S.C. §103(a) over Johnson '901 and Wiechmann et al U.S. Patent 6,009,110. The Office Action cites Wiechmann '110 as teaching generating a harmonic laser from a fundamental wave laser by laser oscillation. However, Weichmann '110 does not teach or suggest a laser device including a Q switch configured for turning on laser oscillation during a first pause period before a generation of the laser pulse train, and for turning off the laser oscillation during a second pause period before a generation of the laser pulse train, as recited in applicants' claims 10 and 28.

For the foregoing reasons, neither Johnson '901 nor Weichmann '110 contains any teaching, suggestion, reason, motivation or incentive that would have led one of ordinary skill in the art to applicants' claimed invention. Nor is there any disclosure or teaching in either of these references which would have suggested the desirability of combining any portions thereof effectively to anticipate or suggest applicants' presently claimed invention. Claim 16, which depends from claim 10, is allowable for the same

reasons as claim 10, and claims 34 and 35, which depend from claim 28, are allowable for the same reasons as claim 28. Accordingly, reconsideration and withdrawal of this rejection are respectfully requested.

All claims 1-42 are now proper in form and patentably distinguished over all grounds of rejection cited in the Office Action. Accordingly, allowance of all claims 1-42 is respectfully requested.

Should the Examiner deem that any further action by the applicants would be desirable to place this application in even better condition for issue, the Examiner is requested to telephone applicants' undersigned representatives.

Respectfully submitted,

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An optical operation of the harmonic-generating Q switch laser device will be explained with referring to Fig. 13~~8~~. Fig. ~~8~~ 13 shows an internal structure of the laser head 11 of the harmonic-generating Q switch laser device shown in Fig. 7. The head 11 comprises a reflecting mirror 21, a Q switch element 42~~22~~, a gain medium 23, an output mirror 24, a condenser lens 25, a nonlinear optical crystal 26, an optical lens 27, a narrow band filter or dichroic mirror 28, and two lenses 25 and 27. The lenses 25, 27 function as a collimator. The device where the nonlinear optical crystal 26 is disposed outside of the mirrors 21, 24 is called an extra cavity system.

The optical operation of this harmonic-generating Q switch laser head will be explained with referring to Fig. 13~~8~~. When an excitation light enters the gain medium 23, an optical resonation occurs between the reflector mirror 21 and output mirror 24. In this case, when the Q switch element 42~~22~~ inserted between the mirrors 21 and 24 is turned on, the optical path opens, and the laser oscillates. When the element is turned off, the optical path closes, and the oscillation stops. Thus, a pulse laser oscillation is enabled. The Q switch element 42~~22~~ is turned on and off by the RF driver 14 for the Q switch, and enables the Q switch laser head to pulse-oscillate. The laser light issued from the output mirror 24 is condensed by the condenser lens 25, and emitted to the nonlinear optical crystal 26. A harmonic laser is generated by the nonlinear optical crystal 26, is collimated by the optical lens 27, and is separated into an IR laser, a fundamental wave and harmonic laser by the narrow band filter or dichroic mirror 28. The harmonic laser is used for a processing machine.

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BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a diagram for explaining an operation of a Q switch laser device according to a first exemplary embodiment of the present invention.

Fig. 2 is a diagram for explaining an operation of other Q switch laser device according to the first ~~embodiment~~embodiments.

Fig. 3 is a diagram for explaining an operation of a Q switch laser device according to a second exemplary embodiment of the present invention.

Fig. 4 is a diagram for explaining an the operation of other Q switch laser device according to the second embodiment.

Fig. 5 shows a configuration of a laser head of a harmonic-generating Q switch laser device according to the embodiments.

Fig. 6 shows an output characteristic of harmonic generating Q switch laser device according to the embodiment.

Fig. 7 shows a configuration of the harmonic-generating Q switch laser device.

Fig. 8 shows a configuration of a laser head of the harmonic-generating Q switch laser device according to the first embodiment.

Fig. 9 shows a control of a conventional harmonic-generating Q switch laser oscillator.

Fig. 10 shows a control of a conventional harmonic-generating Q switch laser oscillator.

Fig. 11 shows a laser processing machine using a harmonic-generating Q switch laser device.

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Fig. 12 shows an output characteristic of a conventional harmonic-generating Q switch laser device.

Fig. 13 shows the conventional harmonic-generating Q switch laser device.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

(First exemplary embodiment)

Fig. 8 shows a harmonic-generating Q switch laser device of a first exemplary embodiment. An ~~The~~ operation of the~~a~~ laser device ~~according to a first exemplary embodiment of the present invention~~ will be explained with referring to Fig. 1. ~~The harmonic-generating Q switch laser device according to the first embodiment is same as shown in Fig. 8, and a control of the device will be explained.~~

In this device, an arc current of a lamp emitting excitation light or a current of a laser diode (LD) is maintained in constant, and the excitation light power is kept constant, and the Q switch is turned on and off to control a laser oscillation.

As shown in Fig. 1, during a first pause period T1 before an oscillation of a harmonic laser, the Q switch which is turned on sets the device to a continuous oscillation mode for oscillating the laser continuously. During a specified second pause period T2A before a harmonic laser pulse is generated, the Q switch which is turned off makes a laser power be accumulated in the laser medium irradiated with an excitation light. The second pause period T2A is equal to a~~the~~ duration determined through extracting a pulse width TW from ~~of~~ a pulse period T0 of the laser pulse train (T2A=T~~O~~0-TW) ~~extracted by a pulse width TW~~. The pulse width TW is so small to be negligible for the pulse period T0,

and hence the pause period T2A substantially coincides nearly with the pulse period T0.

The second pause period T2A is equal to the duration of a pulse period T0 of the laser pulse train extracted by a pulse width TW. i.e., T2A=T0-TW. In other words, the second pause period T2A is equal to a duration determined through extracting a pulse width TW from a pulse period T0 of the laser pulse train.

By turning on the Q switch 22 during the first pause period T1 before the oscillation of the harmonic laser to set the device to the continuous oscillation mode, a laser gain is prevented from being accumulated in the gain medium. A specified second pause period T2A nearly coinciding with the pulse period T0 of the pulse train which is pre-set before a generation of the pulse makes the laser gain before the oscillation of the harmonic pulse be always kept at a specified value.

Fig. 6 shows a laser output characteristic of the laser device according to the embodiment. As clear from the diagram, the pulse energy at a low frequency where the second pause period T2A is long is prevented from rising excessively, and the nonlinear optical crystal is protected owing to the characteristic. This control, therefore, makes a harmonic pulse be oscillated stably, and eliminates a damage or a shortening of life of the nonlinear optical crystal. Further, the control prevents a giant pulse from being generated without the FPS function.

In the laser processing machine having such a laser device, a stable harmonic pulse is obtained even if the pulse train is generated randomly. The stable pulse improves the quality of the laser processing and generates no loss time even when the pulse oscillation condition

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What is claimed is:

1. (Amended) A laser device for generating a laser pulse train formed of a sequence of laser pulses, comprising:

an output mirror;

a reflector mirror;

a gain medium ~~disposed~~ located between said output mirror and reflector mirror for accumulating a laser gain;

a Q switch ~~disposed~~ located between said output mirror and reflector mirror for turning on and off a laser oscillation by said output mirror, reflector mirror, and gain medium, said Q switch for turning on laser oscillation during a first pause period before a generation of the laser pulse train, and for turning off the laser oscillation during a second pause period before a generation of the laser pulse train; and

a nonlinear optical crystal irradiated with a fundamental wave laser light by the laser oscillation for generating a harmonic laser light, ~~wherein the laser oscillation is turned on by said Q switch during a first pause period before a generation of the laser pulse train, and the laser oscillation is turned off by said Q switch during a second pause period before a generation of the laser pulse~~.

2. (Amended) The laser device of claim 1, wherein said nonlinear optical crystal is ~~disposed~~ located between said output mirror and reflector mirror.

3. (Amended) The laser device of claim 1, further comprising a harmonic dispensing device for dispensing harmonic laser pulses located ~~disposed~~ in an output path of the laser pulse.

4. The laser device of claim 3, wherein said harmonic dispensing device is an optical modulator.

5. (Amended) The laser device of claim 1, wherein said ~~nonlinear optical crystal~~output mirror is ~~disposed~~ located between ~~at an opposite side of~~ said reflector mirror ~~about~~ and said nonlinear optical crystal~~output mirror~~.

6. (Amended) The laser device of claim 1, wherein the second pause period is ~~substantially~~ equal to a duration comprising a width of each of laser pulses extracted from a period of the laser pulse train ~~extracted by a width of the laser pulse~~.

7. (Amended) The laser device of claim 1, wherein the second pause period is ~~smaller~~ less than a duration comprising a width of each of laser pulses extracted from a~~the~~ period of the laser pulse train ~~extracted by the width of the laser pulse~~.

8. The laser device of claim 7, wherein a power of the laser pulse is controlled by the second pause period.

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9. (Amended) The laser device of claim 1, further comprising a filter for separating the harmonic laser light generated by said nonlinear optical crystal and the fundamental wave laser light.

10. (Amended) A method of controlling a laser device having: an output mirror;, a reflector mirror;, and a gain medium ~~disposed~~ located between said output mirror and reflector mirror for accumulating laser gain, for generating a laser pulse train formed of a sequence of ~~periodic~~ laser pulses by a laser oscillation by said output mirror, reflector mirror and gain medium, said method comprising ~~the steps of~~:

turning on the laser oscillation during a first pause period before a generation of the laser pulse train, wherein the laser light continuously oscillates during the first pause period; and

turning off the laser oscillation during a second pause period before a generation of the laser pulse.

11. (Amended) The method of claim 10, further comprising ~~the step of~~ dispensing only the laser pulse.

12. (Amended) The method of claim 11, wherein said ~~step of~~ dispensing only the laser pulse comprises the ~~sub-step of~~ dispensing only the laser pulse by an optical modulator.

13. (Amended) –The method of claim 10, wherein the second pause period is ~~substantially~~ equal to a duration comprising a width of each of laser pulses extracted from a period of the laser pulse train ~~extracted by a width of the laser pulse~~.

14. (Amended) The method of claim 10, wherein the second pause period is ~~smaller~~ less than a duration comprising a width of each of laser pulses extracted from a~~the~~ period of the laser pulse train extracted by the width of the laser pulse.

15. (Amended) The method of claim 14, wherein a power of the laser pulse is controlled ~~with~~ according to the second pause period.

16. (Amended) The method of claim 10, further comprising ~~the step of~~ generating harmonic laser light from a fundamental wave laser light by the laser oscillation.

17. (Amended) The method of claim 16, further comprising ~~the step of~~ separating the harmonic laser light and the fundamental wave laser light.

Version with Markings to Show Changes Made

18

18. (Amended) A laser processing machine for processing ~~a~~ ~~work~~an article, ~~having~~ including a laser device for generating a laser pulse train formed of a sequence of laser pulses, said laser device comprising:

an output mirror;

a reflector mirror;

a gain medium ~~disposed~~ located between said output mirror and reflector mirror for accumulating a laser gain;

a Q switch ~~disposed~~ located between said output mirror and reflector mirror for turning on and off the laser oscillation by said output mirror, reflector mirror and gain medium, said Q switch for turning on laser oscillation during a first pause period before a generation of the laser pulse train, and for turning off the laser oscillation during a second pause period before a generation of the laser pulse train; and

a nonlinear optical crystal irradiated with a fundamental wave laser light by the laser oscillation for generating a harmonic laser light, ~~wherein the laser oscillation is turned on by said Q switch during a first pause period before a generation of the laser pulse train, and the laser oscillation is turned off by said Q switch during a second pause period before a generation of the laser pulse~~.

19. (Amended) The laser processing machine of claim 18, wherein said nonlinear optical crystal is ~~disposed~~ located between said output mirror and reflector mirror.

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20. (Amended) The laser processing machine of claim 18, further comprising a harmonic dispensing device for dispensing harmonic laser pulses located ~~disposed~~ in an output path of the laser pulse.

21. (Amended) The laser processing machine of claim 20, wherein said harmonic dispensing device ~~is~~ comprises an optical modulator.

22. (Amended) The laser processing machine of claim 18, wherein said ~~nonlinear optical crystal~~output mirror is ~~disposed at an~~located between ~~opposite side of~~ said reflector mirror ~~about said output mirror~~and said nonlinear optical crystal.

23. (Amended) The laser processing machine of claim 18, wherein the second pause period is ~~substantially~~ equal to a duration comprising a width of each of laser pulses extracted from a period of the laser pulse train ~~extracted by a width of the laser pulse~~.

24. (Amended) The laser processing machine of claim 18, wherein the second pause period is ~~smaller~~ less than a duration comprising a width of each of laser pulses extracted from ~~the~~ a period of the laser pulse train ~~extracted by the width of the laser pulse~~.

25. The laser processing machine of claim 24, wherein a power of the laser pulse is controlled with the second pause period.

26. (Amended) The laser processing machine of claim 18, further comprising a filter for separating ~~the~~ harmonic laser light generated by the nonlinear optical crystal and the fundamental wave laser light.

27. (Amended) The laser processing machine of claim 18, wherein the ~~work~~ article is a printed circuit board.

28. (Amended) A method of processing ~~a work~~an article using a laser processing machine including a laser device having: an output mirror~~;~~, a reflector mirror~~;~~, and a gain medium ~~disposed~~ located between said output mirror and reflector mirror for accumulating a laser gain, for generating a laser pulse train formed of a sequence of periodic laser pulses by a laser oscillation by said output mirror, reflector mirror and gain medium, said method comprising ~~the steps of~~:

turning on the laser oscillation during a first pause period before a generation of the laser pulse train, wherein the laser light continuously oscillates during the first pause period; and

turning off the laser oscillation during a second pause period before a generation of the laser pulse.

29. (Amended) The method of claim 28, further comprising ~~the step of~~ dispensing only the laser pulse.

30. (Amended) The method of claim 29, wherein said ~~step of~~ dispensing only the laser pulse comprises ~~the sub step of~~ dispensing only the laser pulse by an optical modulator.

31. (Amended) The method of claim 28, wherein the second pause period is ~~substantially~~ equal to a duration comprising a width of each of laser pulses extracted from a period of the laser pulse train ~~extracted by a width of the laser pulse~~.

32. (Amended) The method of claim 28, wherein the second pause period is ~~smaller~~ less than a duration comprising a width of each of laser pulses extracted from ~~the~~ a period of the laser pulse train ~~extracted by the width of the laser pulse~~.

33. The method of claim 32, wherein a power of the laser pulse is controlled with the second pause period.

34. (Amended) The method of claim 28, further comprising ~~the step of~~ generating a harmonic laser light from a fundamental wave laser light by the laser oscillation.

35. (Amended) The method of claim 34, further comprising ~~the step of~~ separating the harmonic laser light and the fundamental wave laser light.

36. (Amended) The method of claim 28, wherein the ~~work~~ article is a printed circuit board.